CHAPTER 25

Health Maintenance

Sherry Huang and Sherri L. Morgan

Stedman's Medical Dictionary defines screening as "examination of a group of usually asymptomatic individuals to detect those with a high probability of having a given disease, typically by means of an inexpensive diagnostic test."

Talking to patients about health maintenance and screening tests should occur at any given opportunity, whether in acute, chronic, or preventive service visits. The clinician's role is to present the recommendations, potential benefits, possible harms, and limitations of the tests. Different organizations have varying recommendations. This chapter focuses on the guidelines developed by the USPSTF with input from other organizations. The task force evaluates the evidence along with the risks and benefits (Table 25-1). An Interactive Preventive Services Selector (IPSS) allows clinicians to identify screening tests needed while face to face with the patient in the office. The IPSS in a web form or PDA download can be obtained from the Agency for Healthcare Research and Quality (AHRQ) website (www.ahrq.gov). A chart of common screening tests for adults with average risk is shown in Table 25-2. Deciding whether to screen is based on patient preferences, medical contraindications, and available resources for testing and follow-up. If the test is declined, the discussion should be documented in the chart along with the patient's decision.

ADULT FEMALE

SCREENING FOR BREAST CANCER

The USPSTF recommends routine screening every 1 to 2 years for women between the ages of 40 and 70 with mammography (with or without clinical breast examination) (B recommendation). The USPSTF recommends referral for genetic counseling and *BRCA* testing for women whose family history is associated with an increased risk for mutations in *BRCA1* or *BRCA2* genes (B recommendation). The age to initiate screening in patients with average risk is 40 years.

Risk Factors

- Family history of breast or ovarian cancer in a first-degree female relative (especially if diagnosed before menopause)
- Previous breast biopsy revealing atypical hyperplasia

Table 25-1. The U.S. Preventive Services Task Force (USPSTF)

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations based on the strength of evidence and magnitude of net benefit (benefits minus harms).

A. The USPSTF strongly recommends that clinicians provide [the service] to eligible patients. The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms.
B. The USPSTF recommends that clinicians provide [the service] to eligible patients. The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms.
C. The USPSTF makes no recommendation for or against routine provision of [the service]. The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation.
D. The USPSTF recommends against routinely providing [the service] to asymptomatic patients. The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits.
I. The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. Evidence that [the service] is effective is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

From www.ahrq.gov/clinic/pocketgd/gcps1.htm#Overview.

- Previous chest radiation
- Early menarche or late menopause
- Diethylstilbestrol (DES) exposure
- Long-term HRT
- Having no children or having a first child after age 30
- Having more than one alcoholic beverage a day
- Being overweight

Referral for counseling and *BRCA* testing is recommended for those with specific family history associated with the *BRCA1* or *BRCA2* genes. The USPSTF recommends against routine referral for women whose family history is not associated with the genetic mutations (D recommendation).

- Frequency: every 12 to 33 months. The American College of Obstetricians and Gynecologists (ACOG) recommends testing every 1 to 2 years between ages 40 to 49 and annually after age 50. The USPSTF cites little evidence showing annual screening to be more effective than biennial screening at more than 50 years of age.
- Age to discontinue screening: unknown. Very little evidence available beyond age 70. Factor in comorbid conditions in decision process.
- Evidence on breast self-examinations and routine clinical breast examinations: evidence is sufficient to determine the effect on breast cancer mortality

Table 25-2. Preventive Services and USPSTF Grades by Gender and Age for Persons of Average Risk*

TEST (MALE, FEMALE)/AGE	18	20	21	35	40	45	50	60	65	70	≥75
Alcohol misuse (M&F)	B (frequency individualized)										
Blood pressure (M&F)	A (every 2 years if normal blood pressures)										
Colorectal cancer (M&F)							A (frequency depends on the test used and risk)				
Depression (M&F)	B (frequency individualized)										
HIV (M&F)	A (frequency individualized)										
Obesity (M&F)	B (frequency individualized)										
Tobacco use (M&F)	A (frequency individualized)										
Lipid disorder (M)		B (if higher risk)		A (consider every 5 years if average risk)							
Prostate cancer (M)											
Breast cancer (F)					B (every 1-2 years)						
BRCA mutation (F)	B (once only if applicable)										
Cervical cancer (F)			A (see section)								
Chlamydia (F)	A (frequency individualized)										
Gonorrhea (F)	B (frequency individualized)										
Lipid disorder (F)		B (if higher risk)				A (consider every 5 years if average risk)					
Osteoporosis (F)									B (no more than once every 2 years)		

*See specific topic sections for higher-risk persons.
F, Female; *HIV,* human immunodeficiency virus; *M,* male.

SCREENING FOR CERVICAL CANCER

The USPSTF strongly recommends screening sexually active women for cervical cancer (A recommendation). The age to initiate screening is approximately 3 years after onset of vaginal intercourse or age 21, whichever is first. This is a deviation from the previous recommendation to start screening by age 18. This recommendation is based on the course of human papillomavirus (HPV) infection, its transient nature in young women with normal immune systems, and the usually slow progression to high-grade lesions and cervical cancer. Screening women who have never been sexually active by age 21 has minimal value, but it addresses the concern that accurate sexual history may not always be attainable.

Risk Factors

- History of cervical neoplasia
- Infection with HPV or other sexually transmitted diseases
- High-risk sexual behavior
- History of DES exposure
- HIV infection
- A weak immune system

Frequency of screening is variable. The American Cancer Society (ACS) recommends yearly conventional Papanicolaou (Pap) test or every 2 years with a liquid-based Pap test up to age 30. After age 30 and having had three normal consecutive tests, screening may be lengthened to every 2 to 3 years or, alternatively, a Pap test plus high-risk HPV deoxyribonucleic acid (DNA) testing every 3 years. Annual screening should be done in high-risk women. High-risk HPV DNA testing with Pap smear as primary screening for women under age 30 is not appropriate because many infections are transient in this age group.

The age to discontinue screening is between 65 and 70, if there were previous normal tests. The ACOG does not recommend an age to stop screening. Factors to consider are adequacy of prior screening, test results, and absence of risk factors. For women who are older than 70 and never had testing, screening is appropriate if comorbid conditions do not limit benefit of testing.

For women who have confirmed total hysterectomy for benign disease (e.g., without history of cancer or precancer), discontinuation of vaginal cytological screening is appropriate.

SCREENING FOR ENDOMETRIAL (UTERINE) CANCER

The USPSTF makes no recommendation on screening for endometrial cancer. The ACS recommends all women be informed about endometrial cancer at menopause, and to report any unexpected bleeding or spotting. Annual screening with endometrial biopsy should

be offered at age 35 for women with or at high risk for hereditary nonpolyposis colon cancer.

SCREENING FOR OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN

The USPSTF recommends routine screening for osteoporosis in women ages 65 and older, and earlier screening at age 60 for women with increased risk (B recommendation).

Risk Factors for Low Bone Mineral Density

- Lower body weight (weight <70 kg)
- No current use of estrogen therapy

Other Risk Factors That Have Less Supporting Evidence

- Smoking
- Weight loss
- Family history
- Decreased physical activity
- Alcohol or caffeine use
- Low calcium and vitamin D intake

White and Asian women are more likely to develop osteoporosis.

- Frequency of screening: no studies available. A minimum of 2 years may be needed to reliably measure a change in bone mineral density.
- Age to stop screening: no data available. Limited data on women more than 85 years old.

PREGNANT WOMEN

- Alcohol use: screen and inform of harmful effects on fetus (B recommendation)
- Asymptomatic bacteriuria: routine screen using urine culture at 12 to 16 weeks' gestation (A recommendation)
- Chlamydia infection: routine screen if ages 25 years and younger or if at increased risk (B recommendation)
- Gonorrhea infection: screen if high risk (B recommendation)
- Hepatitis B virus infection: routine screen (A recommendation)
- HIV infection: routine screen (A recommendation)
- Iron deficiency anemia: routine screen (B recommendation)
- Rh(D) incompatibility: blood typing and antibody testing at first prenatal visit (A recommendation); repeat Rh(D) antibody testing for all Rh(D)-negative women at 24 to 28 weeks' gestation (unless biologic father is known to be Rh(D)-negative) (B recommendation)
- Syphilis infection: routine screen (A recommendation)
- Tobacco use: routine screen (A recommendation)

ADULT MALE AND FEMALE

SCREENING FOR ALCOHOL MISUSE

The USPSTF recommends screening for alcohol misuse in adults (B recommendation).

Definitions

- "Risky/hazardous" alcohol misuse is having more than 14 drinks per week or more than 4 drinks per occasion for men and having more than 7 drinks per week, or more than 3 drinks per occasion for women.
- "Harmful drinking" occurs when there is harm from alcohol use but drinker has not yet met criteria for dependence.
- "Alcohol abuse" and "dependence" are associated with repeated negative effects from alcohol.
- "Binge drinking" occurs when five or more alcoholic beverages are consumed by a male, or four or more alcoholic beverages by a female, on at least one occasion during the past month.

The "5-A" behavioral counseling can be implemented: Assess for alcohol abuse or dependence; Advise to reduce consumption; Agree on goals; Assist to achieve behavior change; and Arrange follow-up. Assessment can be made with a quick screening tool, the CAGE questions—feeling the need to **C**ut down, feeling **A**nnoyed by criticism, feeling **G**uilty about drinking, and needing an **E**ye-opener in the morning. A study of 518 patients using a cutoff score of 2 showed the CAGE questions had 75% sensitivity and 96% specificity.

SCREENING FOR COLORECTAL CANCER

The USPSTF strongly recommends screening adults ages 50 and older for colorectal cancer.

Five screening options are available:

- Home FOBT using two samples from three consecutive stools without rehydration or dietary restriction; a single FOBT from a digital rectal examination is not adequate screening
- Flexible sigmoidoscopy
- Home FOBT plus flexible sigmoidoscopy (if FOBT is heme positive, refer directly for colonoscopy)
- Double-contrast barium enema (DCBE)
- Colonoscopy

The combination of FOBT and flexible sigmoidoscopy is regarded as better than either modality alone. Choosing the mode for screening is based on patient preference and type of testing available.

Risk should be assessed well in advance, as early as 20 years of age, to assess patients with high risk. Patients with increased risk include those who have a personal history of colorectal cancer or adenomatous polyps, or have a first-degree relative diagnosed

before age 60, or have two or more relatives diagnosed at any age that is not part of a hereditary syndrome. High-risk patients are those with a family history of familial adenomatous polyposis or hereditary nonpolyposis colorectal cancer, or have a personal history of IBD.

- Age to initiate screening depends on risk. For patients with average risk, begin screening at age 50. If at increased risk, begin at age 40 or 10 years prior to the age of the youngest relative when diagnosed, whichever is first. If at high risk, refer to a center with experience in managing these disorders; screening may start as early as puberty in certain disorders.
- Frequency of screening (for patients with average risk): depends on the test. FOBT annually, flexible sigmoidoscopy or double-contrast barium enema every 5 years, and colonoscopy every 10 years is recommended.
- Age to discontinue screening (for patients with average risk): unknown. Studies are limited to patients younger than 80 years of age. Factor in comorbid conditions and life expectancy in the decision process.

SCREENING FOR DEPRESSION

The USPSTF recommends screening adults for depression (B recommendation). Commonly used screening tools include the Zung Self-Assessment Depression Scale and the Beck Depression Inventory. Whooley and associates found that simply asking two questions about mood and anhedonia, "Over the past 2 weeks, have you felt down, depressed, or hopeless?" and "Over the past 2 weeks, have you felt little interest or pleasure in doing things?" may be as effective. The screening tool used depends on clinician preference and the appropriate population.

- Frequency of screening: unknown. Rescreen in patients with a history of depression, unexplained somatic symptoms, comorbid psychologic conditions, substance abuse, or chronic pain.

SCREENING FOR HIGH BLOOD PRESSURE

The USPSTF strongly recommends screening adults ages 18 and older for high blood pressure (A recommendation).

The sixth report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 6) recommends screening every 2 years for average-risk patients whose systolic blood pressure is less than 130 mm Hg and diastolic blood pressure is less than 85 mm Hg. More frequent screening intervals are recommended for those with higher blood pressures.

SCREENING FOR INFECTIOUS DISEASES

- Chlamydia infection: routine screen in sexually active women age 25 and younger, and other asymptomatic women at increased risk (A recommendation); no conclusion on routine screening in asymptomatic men (I recommendation)
- Gonorrhea infection: screen sexually active women if at increased risk (B recommendation); no conclusion on routine screening in high-risk men (I recommendation)
- HIV infection: screen if at increased risk (A recommendation); CDC recommends offering routine screen for all persons ages 13-64
- Syphilis infection: screen if at increased risk (A recommendation)
- Tuberculosis infection: screen if at increased risk (CDC recommendations)

SCREENING FOR LIPID DISORDERS

The USPSTF strongly recommends routine screening of men ages 35 years and older and women 45 years and older for lipid disorders (A recommendation). Earlier screening is recommended for men ages 20 to 35 and for women ages 20 to 45 who have diabetes, family history of cardiovascular disease before age 50 in male relatives or age 60 years in female relatives, family history suggestive of familial hyperlipidemia, and/or multiple coronary heart disease risk factors (e.g., tobacco use, hypertension) (B recommendation).

- Frequency of screening: unknown. One option includes testing every 5 years. Age to discontinue screening: unknown. Lipid levels are less likely to increase after age 65.

SCREENING FOR OBESITY IN ADULTS

The USPSTF recommends screening of all adults for obesity (B recommendation). Measuring body mass index (BMI, calculated as weight in kilograms divided by height in meters squared) and measuring central adiposity (usually waist circumference) are two simple and popular methods for screening for obesity. Increased BMI and central adiposity are independently associated with an increase in adverse health effects.

Definitions

- BMI between 25 and 29.9 is overweight
- BMI of 30 and above is obese. Three classes of obesity are as follows:
  - Class I (BMI 30 to 34.9)
  - Class II (BMI 35 to 39.9)
  - Class III (BMI 40 and above)

- Men with waist circumferences greater than 102 cm (>40 inches) and women with waist circumferences greater than 88 cm (>35 inches) are at increased risk for cardiovascular disease.
- When a BMI is greater than 35, waist circumference values are not reliable. Counseling to promote sustained weight loss should be provided.

SCREENING FOR TOBACCO USE

The USPSTF strongly recommends screening adults for tobacco use (A recommendation). The 5-A behavioral counseling method can be implemented for positive screens.

CHILDREN (BIRTH TO 11 YEARS OF AGE)

The well-child visit is an opportunity for both the primary care physician and patient's caregivers to work together to optimize a child's physical and emotional potential. This provides the caregivers an opportunity to ask questions related to the child's health and developmental process and the provider an opportunity to perform appropriate screening and physical assessment, administer immunizations, and provide adequate education to the family.

Recommendations for preventive pediatric health care have been developed by the USPSTF and the American Academy of Pediatrics (AAP).

- History—Review specific body systems when indicated by age with special attention to family history and concerns. Review information on prenatal history (newborn visit), feeding and nutrition, elimination, sleep, family relationships, school, high-risk behaviors (tobacco, alcohol and/or substance abuse, sexual activity), and activities or interests.
- Measurements—Weight, height/length, head circumference (to age 24 months), blood pressure (measured at least once during each health care visit starting at age 3 years; hypertension is defined as average systolic blood pressure [SBP] and/or diastolic blood pressure [DBP] >95th percentile for gender, age, and height on more than three occasions; prehypertension in children is defined as average SBP or DBP >90th percentile but <95th percentile). Calculate BMI starting at age 2 years (overweight is defined as BMI for age >95th percentile and at risk for overweight is defined as BMI for age >85th and <95th percentiles). Suspect an eating disorder with weight loss more than 10% of previous weight and/or BMI for age less than the 5th percentile.
- Sensory screening—The USPSTF recommends screening to detect amblyopia, strabismus, and visual acuity younger than age 5 years. Screening for hearing in asymptomatic children older than 3 years is not recommended. Screening should be conducted prior to age 3 years because adequate hearing is essential for normal speech and language development.

- Development/behavioral assessment—Regular and specific developmental screening of gross motor function, fine motor skills, and speech milestones should be performed so that delays can be identified as soon as possible. Research shows that parental developmental reports are as accurate as more time-intensive screening tools.
- Physical assessment—The assessment must be comprehensive and include components relevant to the patient's age, chronic conditions, or risks due to family health history.

ADOLESCENTS

Adolescence is a time of transition, affecting the teen, the family, and the health care provider. During this transition adolescents progress through different stages of development with variations in their level of cognition and developmental tasks. These variations affect how adolescents respond to health care providers during their health maintenance services.

The adolescent period is divided into three stages: early (ages 11 to 13 years) when concrete thinking leads to information being taken literally; midadolescence (ages 14 to 16 years) with increased capacity for abstract thinking with self-focused value system; and late adolescence (ages 17 to 20 years) when abstract thinking ability is fully developed, which allows them to reflect on things objectively. This can lead to a high level of self-confidence in one's reasoning ability, which in turn can lead to risk-taking behaviors.

Various guidelines for preventive and health maintenance services for adolescents have been developed by the USPSTF, the American Medical Association (AMA), and the AAP. The purpose of preventive and maintenance services is to reduce serious morbidity and premature mortality.

- Screening and history—Adolescents should be screened at least annually for the following medical conditions:
  - Hypertension: Defined as average SBP and/or DBP greater than the 95th percentile for gender, age, and height on more than three occasions. Adolescents with BP more than 120/80 are considered prehypertensive.
  - Weight: Overweight is defined as BMI for age greater than the 95th percentile; at risk for overweight is defined as BMI for age greater than the 85th and less than the 95th percentile; suspect an eating disorder with weight loss more than 10% of previous weight and/or BMI for age less than the 5th percentile.
  - Hyperlipidemia if patient and/or family has a history of premature CAD, obesity, hypertension, diabetes mellitus, or a total cholesterol greater than 200 mg/dL.

Screening should also cover activities related to high-risk behaviors (tobacco use, alcohol and drug use, unprotected sexual activity), abuse (physical, sexual, and emotional), violence, and school performance. Table 25-3 lists useful mnemonics.

Table 25-3. Mnemonics Useful in Evaluating Adolescent Patients

HEADS
Home, habits
Education, employment, exercise
Accidents, ambition, activities, abuse
Drugs (tobacco, alcohol, others), diet, depression
Sex, suicide

SAFE TEENS	
Sexuality	**T**oxins (tobacco/alcohol, others)
Accident, abuse	**E**nvironment (school, home, friends)
Firearms/homicide	**E**xercise
Emotions (suicide/depression)	**N**utrition
	Shots (immunization status, school performance)

From Montalto N: Implementing the guidelines for adolescent preventive service, *Am Fam Physician* 57, 1998.

PHYSICAL ASSESSMENT

Recommendations regarding the frequency of routine physical examinations for adolescents have varied from annually to once every 2 to 3 years. Most of the literature recommends at least one comprehensive assessment during each stage of adolescence.

Tests and Diagnostic Studies

- Fasting lipids performed annually if patient and/or family history of premature coronary artery disease, obesity, hypertension, diabetes mellitus, or a total cholesterol greater than 200 mg/dL
- Tuberculosis if there is exposure to active TB or if patient lives or works in high-risk situation
- Gonorrhea, chlamydia, syphilis, and HPV screen annually if sexually active
- HIV screen if high risk for infection through behavior or exposure. The CDC recommends offering routine screening to all starting at age 13.
- Pap smear annually if high risk for cervical abnormalities and/or high-risk behavior
- Immunizations
- Anticipatory guidance—All adolescents should receive annual health guidance to promote a better understanding of their physical growth, psychosocial and psychosexual development, and the importance of becoming actively involved in decisions regarding their health care. This guidance should also cover dietary habits

including healthy diet, benefits of physical activity and exercise, responsible sexual behaviors including abstinence, and promotion of the avoidance of tobacco, alcohol, and other abusable substances including OTC medications and sports-enhancement drugs.

Anticipatory guidance should also be provided to parents or other adult caregivers at least once during each stage of the child's adolescence about adolescent development (including physical, sexual, and emotional), signs and symptoms of disease and emotional distress, parenting behaviors that promote healthy adolescent adjustment, methods for helping their adolescent avoid high-risk behaviors and ways to discuss health-related behaviors with their adolescent.

TESTS AND DIAGNOSTIC STUDIES

- Anemia—The USPSTF does not recommend screening in asymptomatic low-risk children beyond infancy (15 months).
- Lead—The AAP recommends screening children between ages 6 months and 6 years who have not been screened previously if they live or spend time in buildings built before 1950 or have damaged paint, receive government assistance (Medicaid), live in areas with a high or unknown prevalence of elevated childhood lead levels, or have a housemate or playmate with elevated serum lead level. Additionally, screening should be done in accordance to state law when applicable.
- Lipids—Universal screening in children is not recommended. Screening is recommended in high-risk children ages 2 to 20 years who have a parent with total cholesterol level greater than 200 mg/dL or a first-degree relative with premature CAD.
- Tuberculosis—Recommended only in high-risk children (exposure to active tuberculosis, has HIV, incarcerated or lives or works in high-risk situation)
- Pelvic examination—The USPSTF recommends screening for cervical cancer in females who are sexually active annually along with screening for STDs (chlamydia, gonorrhea).
- Immunizations
- Anticipatory guidance—Provide to the caregivers at each appointment age-appropriate, evidence-based guidelines on healthy diet, feeding and nutrition, sleep habits, oral health, safety issues, illness prevention and recognition, and developmental stages and milestones.

References

American Academy of Pediatrics (AAP): Recommendations for Pediatric Preventive Health Care 1995/2000.

American Cancer Society Guidelines on Screening and Surveillance for the Early Detection of Adenomatous Polyps and Colorectal Cancer. Reprinted from CA – *A Cancer Journal for Clinicians* 51:44–54, 2001.

American Cancer Society: *Cancer facts & figures 2006, screening guidelines for the early detection of cancer in asymptomatic people*, Atlanta, 2006, ACS.

American Medical Association (AMA): Guidelines for adolescent preventive services (GAPS), 1992.

Behrman RD, Kliegman RM, Jenson HB: *Nelson textbook of pediatrics*, 17th ed, Philadelphia, 2003, Saunders.

Centers for Disease Control and Prevention: Recommended childhood and adolescent immunization schedule—United States, 2006, *MMWR* 54:Q1–Q4, 2005.

Centers for Disease Control and Prevention. Revised recommendations for HIV testing in health-care settings and for screening of pregnant women *(MMWR)*. September 22, 2006.

Clark WD: Alcoholism: blocks to diagnosis and treatment, *Am J Med* 71:275–286, 1981.

Ferris DG, Cox JT, O'Connor DM, et al: *Modern colposcopy textbook and atlas*, 2nd ed, 2004, American Society for Colposcopy and Cervical Pathology, Dubuque, IA, pp 533–542.

Grenz K: *Health care guideline: preventive services for children and adolescents*, Bloomington, MN, 2004, Institute for Clinical Systems Improvement.

Rakel RE: *Textbook of family practice*, 6th ed, Philadelphia, 2002, Elsevier.

Spraycar, Marjory: *Stedman's medical dictionary*, 26th ed, Baltimore, 1995, Williams and Wilkins.

Whooley MA, Avins AL, Miranda J, Browner WS: Case-finding instruments for depression: two questions are as good as many, *J Gen Intern Med* 12: 439–445, 1997.